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Life-History and Habits of Galeruca pomonae Scopoli, in Illinois.

JOHN J. DAVIS, University of Illinois, Urbana, Ill.

(Plate IX)

So little is known of the life-history and habits of *Galeruca pomonae* in this country, that the following observations, made last year, are worth recording.

Mr. Frederick Knab has reported the occurrence of this European species in North America, in ENTOMOLOGICAL NEWS, Vol. 16, page 230. It was found by him in the collections of the Illinois State Laboratory of Natural History and of Mr. Chas. Dury. The Illinois specimens were reared by Mr. C. A. Hart from larvae collected at Urbana, Ill., and Mr. Dury's specimens were taken at Cincinnati, Ohio. This species had previously been confused with *G. externa* and *tanaceti.* (ENT. NEWS, Vol. 14., p. 146 and *loc. cit.*)

Outside of Illinois it is known to have been taken only at Cincinnati, Ohio, where about the year 1878 Mr. Dury collected the adults in May and June by "sweeping low vegetation in shady places." This is the earliest record of its presence in

distance from Urbana. Here again the larvæ were remarkably local in distribution, the distribution being far less extensive than that of their food plant. These facts seem to show that these beetles spread very slowly and this is probably the reason why the species is not more evenly and more abundantly distributed in this country, although in Europe they are sometimes quite common and in some cases they have been very destructive.

My attention was first attracted to this insect in the spring of 1905, when larvæ were found on *Phlox divaricata* at Urbana and Muncie, Illinois. In 1906 larvæ were also collected at these two places as well as the other places mentioned above.

I have worked out all the essential details of the life history. There is but one brood a year. Briefly, the eggs hatch during April or early in May. The young larvæ feed on the leaves of phlox and become full grown during the latter half of May. They enter the earth to pupate, and emerge as adult beetles early in June. The beetles also feed more or less on the leaves or stems of phlox during the entire season, and feed at night; during most of the day they remain hidden under leaves at the base of the plant. About the middle of August they begin to pair and to lay eggs. The beetles gradually die off, leaving the eggs to survive the winter.

The following details of the life-history were obtained last summer in the insectary. Larvæ were first found April 27 on phlox along the north edge of a wood, at the outskirts of Urbana. Most of these larvæ measured about ⅛ inch in length, two of them, however, measuring about 3/16 inch, and they were probably but a few days old. At this stage they fed only on the epidermal parts of the leaf, but as they increased in size they ate the entire leaf. On May 4 and 10, at Muncie, larvæ of all sizes were found, some being ½ inch in length. Other larvæ were collected at Homer, May 14 and 16, and at Urbana again, May 22. The larvæ grew to a length of about ½ to ⅝ inch and by May 14 they had begun to disappear into the earth to pupate. In the insectary, larvæ were found above the earth as late as May 26. The larvæ would dig ½ to 1 inch into the soil and there form a cocoon consisting of a few silken

this country. Mr. Dury also writes me that Miss Brown has lately taken this species at Spring Grove Cemetery, Cincinnati, Ohio. In Mr. Knab's article it was mentioned as having been taken by Prof. W. S. Blatchley in Indiana, but Prof. Blatchley writes me that the specimens in question prove to be *Galerucella dorsata* Say.

The Illinois specimens mentioned by Mr. Knab were reared from larvæ found by Mr. Hart feeding on *Phlox divaricata* and *Dentaria laciniata* near Urbana, May 12, 1888, the beetles emerging June 16 and 18. In all our observations of the past two years, however, they have been found only on *Phlox divaricata.*

In Planzenfeinde, p. 374, Kaltenbach gives the food plants, in Europe, as *Centaurea jacea, Cirsium palustre* and *Scabiosa succisa.*

In the last few years Mr. Hart has collected the larvæ at Urbana, Homer, and Muncie, Illinois, and adults at White Heath, Illinois. I have collected larvæ at Urbana, Homer, and Muncie, Illinois, and adults at Homer and Urbana—the only places where I have looked for them, during the months in which they occur as adults. All these places are within a radius of thirty miles from Urbana, but the actual range of the species is probably much more extensive.

All specimens, both larval and adult, were collected at the edge of the woods, or in the woods, where *Phlox divaricata* grows—this being the only food plant upon which I have found the species. All the beetles which I collected were found around the phlox plants, and usually under leaves at the base of a plant.

The clusters of phlox plants upon which the larvæ were found in Urbana in 1905 occupied an area of not more than ten or fifteen square feet, and in 1906 the larvæ were not found beyond this same limited area, although this was not due to any scarcity of the food plant. Similarly, at Muncie, Illinois, about twenty-three miles east of Urbana, the infested plants were limited to an area of a few square yards, an area no larger than that of the year before at the same place (May 14, 1906). Mr. Hart found the larvæ abundant at Homer, Illinois, a short

bearing three setæ. The maxilla (Fig. 10) is composed distally of the maxillary palpus (b) and the maxillar lobe (Fig. 10, *a*; Fig. 11). The conical maxillary palpus is four-segmented, the tip of the last segment being somewhat blunt and with a slight depression. The maxillar lobe terminates in a finger-like sensory organ (Fig. 11c), which is attached to a rather stout basal portion. Surrounding this organ are eight or more spines, which appear to be for the protection of the central organ. The labium is typical, bearing two-segmented labial palpi; the tip of the last joint of each labial palpus is blunt and with a slight depression, similar to that of the end segment of the maxillary palpus.

The thoracic segments are concolorous with the abdomen and bear numerouus tubercles, excepting, however, the prothorax. The cervical shield is bare of tubercles, but the prothorax bears a large tubercle just below, on each side of the shield and above the anterior pair of legs. On each of the second and third thoracic segments there are eight pairs of tubercles above the legs, and each of these tubercles is abundantly supplied with setæ. On the ventral side of each thoracic segment is a pair of rather large tubercles situated in the middle of the segment and coalescing more or less into one large oblong tubercle. Posterior to these ventral tubercles and slightly farther apart is a pair of very small sub-tubercular areas, with a single seta arising from each. The more dorsal tubercles fall into four longitudinal rows. Legs rather short and stout; the femur and tibia are well developed, but the tarsus is small and bears a single claw.

Abdomen nine-segmented, with many setiferous tubercles arising from all the segments, except the ninth; color dark brown or almost black; spiracles are present on all abdominal segments, except the ninth; there are no abdominal legs. The tubercles are similarly situated on the first eight abdominal segments, but the dorsal tubercles differ from those of the thorax in that they do not fall into four longitudinal rows; the four anterior dorsal tubercles of each segment are more widely separated than the four posterior dorsal ones (Fig. 12). Besides these eight dorsal tubercles there is another

threads with particles of earth interwoven. The larva remained as such in this cell for five or six days before transforming to a pupa. The pupal stage lasted about two weeks and the adult emerged within sixteen to twenty days after the larva entered the earth. After emerging, the adult feeds upon the leaves and tender shoots of the phlox plant. For the first few weeks after emergence the adult eats the leaves voraciously, but later in the summer it feeds only occasionally. The beetles were first noticed in copula August 15, and the first eggs were laid on the upper surface of the leaves several days later. The adults continued to pair and lay eggs until about September 15, at which date the beetles begin to die, leaving only eggs to carry the species through to the next year. Individual females usually lay three or four masses of eggs, each mass consisting of about fifty eggs. Three females laid, respectively, 80, 148 and 185 eggs, an average of 137 eggs per female.

Egg.—Eggs are laid in black masses (Fig. 8) of forty or more, the mass being round or oval, with a finely punctured surface. The individual eggs are polygonal in cross section, and measure between ½ and 1 mm. in diameter.

Larva.—The rather stout, cylindrical larva (Figs. 1, 2) measure 14 mm. in length and 3.75 mm. in width. The entire body is covered with numerous tubercles, from each of which arise from few to many setæ. The color of the full grown larva varies from dark brown to almost black on the dorsal surface and a lighter brown on the ventral. Immediately after a molt the color of the larva is temporarily bright yellow.

The small inconspicuous head is dark brown or black, being darker than the general color of the body. The antennæ are situated at one side of and near the base of the labrum. There is one pair of ocelli, which are situated above and slightly to one side of the antennæ. Around each ocellus is a dark ring. Setæ are scattered abundantly over the head. The labrum is of the type typical for most chrysomelid larvæ and bears four prominent setæ, as well as a number of small and fine hairs. The mandible (Fig. 9) is quadridentate, its surface

cruca pomonae in Indiana. He writes: "In looking over a miscellaneous collection of unplaced Coleoptera, which I have recently mounted, I find a specimen of *Galeruca pomonae* in the collection, taken in Laporte County, Indiana, on August 26, 1904."

A new genus and a new species of Neuroptera.

By Nathan Banks.

Our two small species of *Acanthaclisis* have long been recognized as not true members of that genus; I therefore propose a new genus as follows:

Paranthaclisis n. gen.

I establish this genus for *Acanthaclisis congener* Hagen and *A. hageni* Banks. It is readily known from *Acanthaclisis* by the fact that in the hind wings the anal vein runs into the margin of wing and is connected to the first branch of the cubitus by a cross-vein (in *Acanthaclisis* the anal runs into the first branch of the cubitus). The radial sector is connected to radius by only 10 or 12 cross veins (in *Acanthaclisis*, 20 or 30); in both wings the branches of the cubitus, instead of running directly to the margin, are bent outward, so as to give the appearance of a vein parallel to hind margin. The outer spur of each tibia is bent at a right angle near its middle.

Ululodes arizonensis n. sp.

Closely allied to *U. albifrons* Banks, having annulate antennæ, white hair on face, etc. It differs (1) in larger size, expanse 60 mm. (*albifrons* about 50 mm. or less); (2) in more brown hair near base of antennæ; (3) in having the base of antennal club and several joints before it wholly pale yellowish; (4) in that the last dorsal segment of abdomen is pale and has an isolated black spot each side near tip (in *albifrons* is a black stripe each side); (5) in that the forewings are scarcely emarginate at end of median vein (in *albifrons* this emargination is very distinct); (6) in that the superior appendages of the ♂ are more geniculate at base, and more bent downward and inward, so that, seen from the side, the tip of the abdomen shows an even curve (in *albifrons* these pieces project more outward).

Four specimens from Palmerlee, Arizona (Biederman). The female shows four spots on each hind wing; one large, on hind margin toward base; one just behind the pterostigma, one on hind margin behind the last, and another somewhat basad of the latter.

pair at each lateral edge of the dorsal plate, making in all five pairs of tubercles on the dorsal plate. The lateral plate bears a single tubercle, as does also the sub-lateral plate. The ventral plate bears one distinct pair of tubercles near the side; on each side of the median line and very close together are groups of five to seven setæ, not situated, however, on any distinct tubercle. Posterior to these and farther apart is a single pair of setæ, which appear to arise from a very small tubercle or tubercular spot.

Pupa.—The bright yellow pupa (Figs. 3-5) varies in length from 8 to 11 mm. and has an average width of 4 mm. The pupæ of male beetles are all nearly 8 mm. in length, while those of female beetles are about 10 mm. long. The dorsal surface is slightly convex, and on each abdominal segment there are eight dorsal patches of inconspicuous spines, which correspond to the clusters of setæ of the four pairs of dorsal tubercles on the abdominal segments of the larva. Two tubercles occur on each side of each segment of the abdomen: one on the lateral and one on the sub-lateral surface, the former above and the latter below each spiracle; these tubercles bear many minute spines.

Adult.—The beetles (Figs. 6, 7) are rather broadly ovate, with the dorsal surface strongly convex and clove-brown in color. Males vary in length between 8 and 9 mm. and are 4 to 5 mm. in width. The females are noticeably larger, varying between 9 and 11 mm. in length and 5 to 6 mm. in width. Eyes and antennæ black, the latter being eleven-segmented, and more or less abundantly covered with fine, light colored hairs Prothorax covered with punctures and bearing four transverse protuberances, or callosities, two on each side of a median impressed line. Legs black; under side of tarsi with light-colored pulvilli. Elytra with three shining black longitudinal costæ. The interspaces are covered with more or less confluent punctures. On the margin of each elytron is a narrow yellow band, which fades out at the tip of the elytron.

Since writing this article I have received another letter from Professor Blatchley informing me of the occurrence of *Gal-*

New Micro-lepidoptera.

By Henry Engel, Merrick Museum, New Brighton, Pa.

The species of Microlepidoptera described herewith are part of a large number of species sent to Mr. Busck last winter for determination.

After studying this material Mr. Busck pronounced these and several other species new and suggested that I describe them.

My limited experience with the generic study of Microlepidoptera precluded the possibility of my giving them their proper position and I gladly accepted the kind offer of Mr. Busck to give me notes on, and generic determinations of these species.

The diagnosis of the new genus *Synallagma* was prepared by Mr. Busck. I gratefully acknowledge my obligation to him for determining several hundred species of Microlepidoptera for me.

Depressaria flavicomella n. sp.

Antennæ light ocherous. Labial palpi straw-yellow. On the basal half of the second joint a few brownish scales are intermixed outwardly. Face and head cream color. Thorax pale yellow. Forewing straw-yellow, with sulphurous hue. Base of wing concolorous with thorax. A diffuse rusty clouding over basal part of wing along dorsal margin, and almost to costa. An inwardly oblique brown shade from the outer discal spot to the dorsal suffusion. Outer discal spot centered with white bordered with blackish outwardly. Inner discal spot small and black. Discal and apical area sparsely obscured by brownish scales. Along the costa is a series of brown spots, becoming more pronounced on the apical half of the wing. A row of brown spots along outer margin. Cilia concolorous with ground color. Hind wing silvery white slightly darkened in apical region. A faint interrupted line at base of cilia. Cilia silver white. Forewing beneath dark ocherous, costa marked with pale yellow. Hindwing silvery white. Abdomen pale yellow with two lateral brown lines on under side. Legs silver gray.

Expanse, 15-16 mm.

Hab.—New Brighton, Pa., June 12-27 (Merrick), Oak Station, Pa. (Marloff).

Type No. 10,284, U. S. National Museum. Cotypes in the Merrick Museum, New Brighton, Pa.

This species is allied to *Depressaria senicionella*, Busck. Mr. Busck kindly loaned me a cotype of it for comparison. The pale

yellow forewings, silvery hind wings, and smaller size easily separate it from *senicionella.*

I have before me 22 specimens, all taken at light in a dense forest during June, 1904-1906. Although I have found nearly all the local species hibernating, the only records for this species are in June.

Elaschista albicapitella n. sp.

Antennæ dark brown, gray near tip. Labial palpi silvery white, second joint fuscous beneath. Face silvery white. Collar and thorax a rich dark brown with purplish reflections. Lower edge of patagia and posterior edge of thorax white. Forewing elongate, width of the wing one-third of its length, apex produced. Ground color dark brown. Base of wing yellowish white. A prominent silver white fascia two-fifths from base of wing, extending from costa to dorsal margin, slightly bent outward over cell then straight to dorsal margin. A silver white fascia one-fifth from apex, outwardly oblique, nearly to center of wing. A triangular silvery white spot on dorsal margin, three-fourths from the base, outwardly oblique. Cilia dark gray sprinkled with brown. Hind wing dark fuscous, cilia dark gray. Abdomen dark brown above, pale yellow beneath. Legs brown above, whitish beneath. Underside of forewing blackish, with the outer fascia indicated on costa. Underside of hind wing same as upper side.

Expanse, 8 mm.

Hab.—Pittsburgh, Pa., June 12-17 (Engel).

Type. No. 10,285, U. S. National Museum. Cotypes in the Merrick Museum, New Brighton, Pa.

This species is nearest to the European *Elachista albifrontella,* Hubner, from which it differs in the darker ground of the front wings, the white patagia and the white base of the forewings. The inner fascia is also quite a contrasting difference. An authentic specimen of *albifrontella* was loaned to me by Mr. Busck for comparison.

SYNALLAGMA n. gen.

Head smooth. Labial palpi long, recurved, smooth; terminal joint shorter than second joint, acute. Max. palpi obsolete. Antennæ with basal joint elongate. Forewing elongate lanceolate, with tip produced and hooked downward. 11 veins, vein 11 absent; 7 and 8 stalked to costa; 6 into hooked apex; 1b strongly furcate at base. Hindwing lanceolate, half as wide as forewing. 8 veins, 3 and 4 connate, cell open between 4 and 5, 6 and 7 connate; 7 separate. Posterior tibiæ above with short hairs.

Type of genus *Synallagma busckiella* (Engel).

Synallagma busckiella n. sp.

Antennæ dark gray annulated with silver gray rings, basal joint thickened with scales. Face silver gray, head and thorax covered with flattened scales with coppery green luster. Labial palpi cream color, second joint fuscous beneath, terminal joint with dark line outwardly, tip cream white. Forewing light brown, with strong metallic reflections. A longitudinal cream white line from the base through middle of wing ending in the cell. Beneath terminal of this line a narrow line of like color commences and runs slightly divergent outwardly to the fold. A narrow line of about two-thirds the wing length on the fold near the inner angle. A few bluish black spots at lower end of cell edged with silvery scales. A black ocellus at the apex at beginning of the produced tip. On the costa above the ocelli is a cream white patch divided by a brown fascia. Cilia along termen dark gray, on the curved tip of apex the cilia are short and whitish. Hind wing dark gray with a silvery luster. Cilia concolorous. On the under side both wings are ocherous without any markings. Abdomen gray with coppery reflections above, silver gray beneath. Legs silver gray marked with fuscous above. Expanse, 9-10 mm.

Hab.—Pittsburgh, Pa., June 28, July 18, August 17, Sept. 29 (Engel), Oak Station, Pa. (Marloff).

Type No. 10,286, U. S. National Museum. Cotypes in the Merrick Museum, New Brighton, Pa.

I take pleasure in naming this interesting species in honor of Mr August Busck.

Gracilaria pennsylvaniella n. sp.

Antennæ as long as forewing, light brown with narrow gray annulation. Labial palpi silver white, terminal joint shaded with brown. Face and head silver white, with central indistinct golden line to collar. Collar and thorax golden brown with a silvery line above patagia. Ground and forewing golden brown. Along the costa are four silvery fasciæ edged with black, situated as follows: The first one a trifle more than one-fourth from base, outwardly oblique, nearly to middle of wing, curved toward costa. Second fascia a little beyond middle of costa, outwardly oblique, to middle of wing, curved toward costa. Third fascia is short one-fourth from apex, outwardly oblique. The fourth at the beginning of the costal cilia is short, inwardly oblique. A subbasal silvery streak from the dorsal margin reaching the fold one-fourth from base. An outwardly oblique silvery streak from middle of dorsal margin to fold. A second dorsal streak near inner angle to fold ending near the third costal fascia, edged strongly with brown scales at the point. On the middle of the wing, at apical fourth, is a cluster of bright golden scales, a blackish spot centered with silver just below the apex. Cilia along apical curve white, becoming dark

gray along dorsal edge. Hindwing blackish brown, cilia dark gray. Abdomen gray, anal segment white. Legs white with brown shadings, and brown annulations on tarsal joint.

Expanse, 8-8.5 mm.

Hab.—Pittsburgh, Pa., May 14-27, August 11, October 5 (Engel), Oak Station, Pa. (Marloff).

Type No. 10,287, U. S. National Museum. Cotypes in Merrick Museum, New Brighton, Pa.

This species is near *Gracilaria lespedezaefoliella* Clem., but the larger size, bolder ornamentation, and the comparatively long basal streak separate it from that species.

Tinagma crenulellum n. sp.

Antennæ gray, annulated with ocherous. Labial palpi and head whitish gray. Forewing ocherous strongly dusted with white, giving a speckled appearance to the wing. A broad dark ocherous fascia on the middle of the wing of equal width on costal and dorsal edge. This fascia is poorly defined basaly, but distinctly edged with white outwardly. A pale gray shade crosses the wing beyond this central fascia extending nearly to the apex. Apical part of wing dusted ocherous, cilia coarsely speckled with dark brown and white. Hind wings ocherous, cilia smoky gray. Abdomen ocherous. Legs grayish.

Expanse, 8.5-9.5 mm.

Hab.—Pittsburgh, Pa., May 27-31, 1906, (Engel), New Hampshire.

The latter record was reported by Mr. Busck who received this species from New Hampshire since he had my material for study.

Type in the U. S. Nat'l. Museum. Cotypes in the Merrick Museum, New Brighton, Pa. This species is very close to, if distinct from, the European *Tinagma perdicellum* Zeller It seems advisable to keep it under a separate name until the identity shall eventually be proven by the breeding of both species. The American species has the labial palpi and head whitish, not ocherous, as in the European species, and the central fascia of the forewing has a different angle, more perpendicular not inwardly inclined on dorsal edge as in *perdicellum*. These differences alone would hardly justify the separation of the American form, but it is easier to prove the two forms synonyms than to disprove the faulty record of the European species here.

Andrenae of the Canadian, Alleghanian and Carolinian Plant Zones occurring or likely to occur in Connecticut.

By H. L. Viereck.

TABLE OF SPECIES.

Females.

The head, when viewed from in front, is as long as wide or nearly so . 1.
The head, when viewed from in front, is distinctly longer than wide . 24.

1. Abdomen with the second dorsal segment depressed less than one-half . . . . . 2.
   Abdomen with the second dorsal segment depressed one-half or more than one-half . . . . . 19.
2. First joint of the flagellum shorter than the next two joints combined . . . . . 3.
   First joint of the flagellum as long as or longer than the next two joints combined . . . . . 4.
3. Clypeal punctures not adjoining. Facial fovea more than one-half as wide as the distance between the eye and the lateral ocellus and extending below the antennal line; wings dark brownish; pubescence whitish.
   Enclosure closely wrinkled . . . . . **crataegi.**
   Enclosure with several widely separated striae.
   alleghaniensis n. sp.
   Very like the preceding, but easily distinguished from it and any of its known allies by the very compact punctuation of the clypeus, the punctures being regular and adjoining or so nearly adjoining as to give the impression that they are adjoining.
   daeckei n. sp.
4. Facial fovea separated from the eye margin by a narrow space; facial fovea more than one-half as wide as the distance between the eye and the lateral ocellus; facial fovea extending below the antennal line; the hairs of the outer side of the posterior tibiae simple; wings with three submarginal cells . . . . . 25.
   Facial fovea not separated from the eye margin by a narrow space; only a shining line intervening in some species . . . . . 5.
5. Facial fovea one-half or less than one-half as wide as the distance between the eye and the lateral ocellus . . . . . 13.
6. Facial fovea not extending below the antennal line . . . . . 7.
   Facial fovea extending below the antennal line . . . . . 8.
7. Most of the hairs on the outer side of the posterior tibiae simple, plumose or branched . . . . . 29.
8. Cheeks rounded, without a margin behind . . . . . 11.
   Cheeks rounded, but with a margin behind . . . . . 12.

11. Most of the hairs on the outer side of the posterior tibiae simple . 30.
Most of the hairs on the outer side of the posterior tibiae plumose or branched . . . . . 44.
12. Most of the hairs on the outer side of the posterior tibiae simple . 45.
13. Fovea extending below the antennal line . . . . . 15.
Fovea not extending below the antennal line . . . . . 14.
14. Most of the hairs of the outer surface of the posterior tibiae plumose or branched . . . . . 46.
15. Most of the hairs of the outer surface of the posterior tibiae simple . . . . . 16.
Most of the hairs of the outer surface of the posterior tibiae branched . . . . . 18.
16. The posterior tibiae at their apex twice as wide as the metatarsus . 49.
The posterior tibiae at their apex not twice as wide as the metatarsus . . . . . 17.
17. Species with three submarginal cells . . . . . 50.
Species with two submarginal cells . . . . . 78.
18. Species resembling *arabis* and allies . . . . . 79.
19. Abdomen with the second dorsal segment depressed three-fourths or more . . . . . 22.
Abdomen with the second dorsal segment depressed less than three-fourths . . . . . 20.
20. The shining space between the facial fovea and the eye margin abruptly separated from the fovea . . . . . 21.
The shining space between the facial fovea and the eye margin not abruptly separated from the fovea . . . . . 89.
21. The shining foveal space as wide as, or not as wide as, the fovea below . . . . . 90.
22. The first joint of the flagellum shorter than the second and third joints combined . . . . . 23.
23. The shining foveal space as wide, or not as wide, as the fovea below . . . . . 95.
The shining foveal space wider than the fovea below . . . . . 98.
24. The fovea extending below the antennal line . . . . . 99.
25. Abdomen satiny . . . . . 26.
26. The abdomen without patches that are more conspicuously satiny than the surrounding areas . . . . . 27.
The abdomen with patches that are more conspicuously satiny than the surrounding areas . . . . . 28.
27. Eleven mm. in length, or nearly; process of labrum rather rounded; posterior legs with their tegument dark or black; pubescence on dorsum of thorax ochreous to reddish; scopa of posterior tibiae light in color; anal fimbria golden or brown . . **nivalis.**
Seven to eight mm. in length, or nearly; process of the labrum finger-shaped in outline; pubescence pale, *i. e.* whitish to ochreous; anal fimbria chocolate-brown or of an allied shade . . . **placida.**

28. Process of labrum rounded; abdomen with its tegument partly reddish, the first dorsal segment being black at base and apex. **erythrogaster rhodura.**

29. Ten mm. in length; clypeus uniformly dullish, sparsely punctured, but impunctate along the middle; process of labrum nearly four times as wide as long; thorax and abdomen throughout more or less dullish, like the head, with the exception of the scutellum which is rather shining; pubescence pale, ochreous; scopa of posterior tibiae composed of simple hairs that one might say look very like hair "standing on end;" abdomen subfasciate; color of the anal fimbria sort of a golden brown; wings brownish, with sort of a yellowish tinge . . . . **cornelli.**

30. Abdomen black . . . . . 31.

31. Process of the labrum truncate, or semicircular, or when seen from below, subemarginate 32
Process of the labrum otherwise . . . . . 43.

32. Enclosure of the metanotum granular . . . . . 33.
Enclosure smooth . . . . . 38.

33. The greater portion of the longitudinal middle third of the clypeus impunctate . . . . . 34.
The clypeus not so . . . . . 35.

34. The clypeus with a rather circular impunctate area, which is usually highly polished and conspicuous; abdomen subfasciate. **flavoclypeata.**

35. The clypeus with a narrow but distinct median impunctate space . 36.

36. The clypeus very sparsely punctured . . . . . **robertsoni.**
The clypeus closely punctured . . . . . 37.

37. Pubescence ochreous to brownish-ochreous; abdomen dull; clypeus somewhat flattened . . . . . **arabis.**

38. The tips of the wings distinctly clouded . . . . . 39.
The tips of the wings not so . . . . . 40.

39. Clypeus abundantly and distinctly punctured . . . . . **nubecula.**

40. Dorsulum dull . . . . . 41.
Dorsulum shining . . . . . 42.

41. Clypeus dull and smooth . . . . . **distans.**

42. The abdomen dull . . . . . **canadensis.**

43. Process of the labrum finger-shaped; the anal fimbria from pale brown to blackish in color, usually the latter . . . . . **placida.**

44. Abdomen black; scopa of posterior tibiae loose, *i. e.* with its hairs sparse . . . . . **gerani-maculati.**

45. Process of the labrum quadrate or nearly so, and margined. . **fragilis.**
Process of the labrum rounded, not margined . . . . . **integra.**

46. Face immaculate . . . . . 47.
Face maculated . . . . . 48.

47. Process of the labrum emarginate; clypeus roughened and indistinctly punctured; the dorsulum and scutellum shining. . . **solidaginis.**

48. Process of the labrum not, or hardly, emarginate; clypeus sparsely punctured . . . . . **pulchella.**
49. Enclosure of the metanotu n conspicuously granular . . . . . **nasoni.**
50. Abdomen not distinctly punctured . . . . . 51.
Abdomen distinctly punctured . . . . . 63.
51. Abdomen appearing bare, with no abundant erect hairs . . . . . 52.
Abdomen not appearing bare, with no abundant erect hairs . . . 53.
52. Abdomen and scopa with pale pubescence; wings pale brownish, testaceous; abdomen fasciate; clypeus distinctly punctured and shining . . . . . **novae-angliae** n. sp.
53. Abdomen and scopa with pale pubescence . . . . . 54.
Abdomen above and scopa with dark pubescence . . . . . 60.
54. Abdomen without distinct bands of nearly erect pubescence . . . 55.
Abdomen with distinct bands of nearly erect pubescence . . . . 56.
55. Face with no black pubescence; abdomen fasciate, shining; clypeus with a median impunctate space . . . . . **mandibularis.**
56. Clypeus dull . . . . . 57.
Clypeus shining . . . . . 59.
57. Nearly all of the scopal hairs white . . . . . 58.
58. Anal fimbria gray and fuscous . . . . . **cockerelli.**
59. Scopa golden . . . . . **mandibularis.**
60. Abdominal pubescence mostly pale . . . . . 61.
Abdominal pubescence mostly black . . . . . 62.
61. Face with yellowish pubescence . . . . . **hirticincta.**
62. Clypeus with a median impunctate space . . . . . **milwaukeensis.**
63. Abdomen and scopa with pale hairs . . . . . 64.
Abdomen and scopa with dark or black hairs . . . . . 73.
64. Clypeus with no distinct, shining, median impunctate space . . . 65.
Clypeus with a distinct, shining, median impunctate space . . . 72.
65. Enclosure of the metathorax not rugulose, at most granular . . . 66.
Enclosure of the metathorax rugulose . . . . . 72.
66. Clypeus dull . . . . . 67.
Clypeus shining. . . . . 68.
67. Clypeus very closely punctured, appearing granular; posterior tibiae honey-yellow; scopa thin, not obscuring the tegument. **winkleyi** n. sp.
68. Clypeus not produced . . . . . 69.
Clypeus produced . . . . . **davisi** n. sp.
69. Posterior tibiae honey-yellow . . . . . 70.
Posterior tibiae blackish . . . . . 71.
70. Abdomen subfasciate . . . . . **commoda.**
71. Enclosure wrinkled, process of labrum semicircular in outline. **cressoni.**
72. Enclosure not entirely rugulose . . . . . **hilaris.**
73. Species with some pale pubescence . . . . . 74.
74. Face and pleura with pale pubescence . . . . . 74.
Face and pleura with some black pubescence . . . . . 76.

75. Clypeus with an indistinct median impunctate space . . . . . **vicina.**
76. Clypeus with a median impunctate space . . . . . 77.
77. Species over 12 mm. long; dorsum of thorax with no black pubescence . . . . . **carlini.**
78. Process of labrum forming an obtuse-angled triangle; abdomen black . . . . . **andrenoides-wellesleyana.**
79. Process of labrum emarginate . . . . . 80.
Process of labrum not emarginate . . . . . 85.
80. Process of labrum truncate anteriorly, the truncation wider than the process is long; clypeus shining, not densely punctured; clypeus not maculated . . . . . 81.
81. Clypeus with a median impunctate space . . . . . 82.
Clypeus with no median impunctate space . . . . . 83.
82. Most of the middle third of the clypeus occupied by the impunctate space; species resembling *flavoclypeata* . **pennsylvanicola** n. sp.
83. Species approximately 13 mm. long . . . . . 84.
84. Clypeus polished . . . . . **helianthi.**
Clypeus not polished . . . . . **braccata** n. sp.
85. Clypeus not dull . . . . . 86.
86. Clypeus not densely punctured . . . . . 87.
87. Clypeus with a median impunctate space . . . . . 88.
88. Scopa loose . . . . . **angusi** n. sp.
Scopa compact; wings blackish . . . . . **asteris.**
89. Process of labrum broadly truncate; clypeus with no distinct median impunctate space; the second dorsal abdominal segment depressed practically one-half . . . . . **rehni** n. sp.
90. Second dorsal abdominal segment depressed one-half . . . . . 91.
Second dorsal abdominal segment depressed more than one-half . 94.
91. Abdomen black . . . . . 92.
Abdomen red . . . . . 93.
92. Abdomen fasciate . . . . . **forbesi.**
Abdomen not fasciate . . . . . **marie** var. **concolor.**
93. Abdomen not fasciate . . . . . **mariae.**
94. Posterior tibiae and tarsi black or blackish; abdomen not fasciate. **weedi** n. sp.
Posterior tibiae and tarsi black or blackish; abdomen fasciate . **obscura.**
Posterior tibiae and tarsi honey yellow . . . . . **hippotes.**
95. Second abdominal segment depressed two-thirds . . . . . 96.
Second abdominal segment depressed more than two-thirds . . . 97.
96. Abdomen densely punctured; its segments with no testaceous margin . . . . . **multiplicata.**
97. Abdomen black; depressed portion of second dorsal abdominal segment indistinctly punctured; punctures of the clypeus not fine nor adjoining; enclosure coarsely rugose . . . . . **spireana.**
Abdomen fasciate; depressed portion of second dorsal abdominal segment indistinctly punctured; clypeus with no median impunctate space; posterior tibiae blackish . . **multiplicatiformis** n. sp.

98. Dorsulum with its punctures adjoining or nearly so; the shining space of the face rather oblong.
Abdomen not fasciate . . . . . **rugosa.**
Abdomen fasciate . . . . . **paenerugosa** n. sp.
99. Pubescence pale; anal fimbria brown . . . . . **bradleyi** n. sp.

MALES.

Head viewed from in front as wide as, or wider than long . . . . . 1.
Head viewed from in front longer than wide . . . . . 32.
1. Abdomen with the second segment depressed less than one-half, or at most depressed one-half . . . . . 2.
2. Third joint of the antennae shorter than the next succeeding joint or just as long . . . . . 3.
Third joint of the antennae longer than the next succeeding joint . 8.
3. Penultimate ventral segments with reflexed angles . . . . . **crataegi.**
Penultimate ventral segments with no reflexed angles . . . . . 4.
4. Second dorsal segment depressed one-third . . . . . **daeckei** n. sp.
Second dorsal segment depressed one-half or less than one-half, but more than one-third . . . . . 5.
5. Antennae smooth and shining; enclosure rugose . . . . . **forbesi.**
Antennae smooth and shining; enclosure rugose . **mariae** var. **concolor.**
Antennae smooth and shining; enclosure granular . . **winkleyi** n. sp.
Antennae dull . . . . . 6.
6. Abdomen more or less reddish . . . . . **mariae.**
Abdomen black . . . . . 7.
7. Tarsi yellowish . . . . . **hippotes.**
Tarsi blackish or brownish; enclosure rugose . . . . . **weedi.**
Enclosure granular . . . . . **nasoni.**
8. Face maculated with yellow or whitish . . . . . 25.
Face immaculate . . . . . 9.
9. Third joint of antennae longer than fourth but shorter than fourth or fifth joints combined . . . . . 10.
Third joint of antennae as long as, or longer than the fourth and fifth joints combined . . . . . 24.
10. Cheeks prominently angulate or keeled . . . . . 11.
Cheeks neither angulate nor keeled . . . . . 20.
11. Cheeks prominently angulate, not keeled . . . . . 12.
Cheeks keeled . . . . . **fragilis.**
12. Mandibles toothed on the under side near the base . . . . . 13.
Mandibles not toothed on the under side near the base . . . . . 16.
13. Tooth on the under side of mandibles a mere angle . . . . . 14.
14. Pubescence of abdomen pale . . . . . **mandibularis.**
Part of the pubescence of abdomen dark . . . . . **milwaukeensis.**
16. Face with some black pubescence . . . . . **cockerelli.**
Face with no black pubescence . . . . . 17.
17. Wings in part distinctly clouded with brownish . . . . . **nubecula.**
Wings not so . . . . . 18.

18. Dorsulum polished . . . . . **canadensis.**
Dorsulum dull . . . . . 19.
19. Abdomen dull, with ochreous erect pubescence . . . . . **hirticincta.**
Abdomen shining, with appressed pubescence . **erythrogaster rhodura.**
20. Part of the facial pubescence black . . . . . **carlini.**
Face with no black hairs . . . . . 21.
21. Tarsi yellowish . . . . . **nivalis.**
Tarsi brownish or blackish . . . . . 22.
22. Third joint of antennae as long as succeeding joint . . . . . **vicina.**
Third joint of antennae longer than succeeding joint . . . . . 23.
23. Abdomen sericeous . . . . . **commoda.**
Abdomen not sericeous . . . . . **placida.**
24. Angles of sixth ventral segment of the abdomen reflexed . **erigeniae.**
Angles of sixth ventral segment of the abdomen not reflexed **distans.**
25. Wings with two submarginal cells . . . . . **andrenoides.**
Wings with three submarginal cells . . . . . 26.
26. Cheeks angulate . . . . . **flavoclypeata.**
Cheeks not angulate . . . . . 27.
27. Maculation confined to the clypeus . . . . . 28.
Maculation not confined to the clypeus . . . . . 30.
28. Third joint of antennae as long as fourth and fifth joints combined, or a little longer . . . . . 29.
Third joint of the antennae longer than the fourth joint, but not as long as the fourth and fifth joints combined . . . . **robertsoni.**
29. Pubescence whitish; posterior femora black . . . . . **braccata** n. sp.
Pubescence tawny or ochreous; posterior femora partly yellowish. **helianthi.**
30. Tarsi yellowish . . . . . **pulchella.**
Tarsi brownish or blackish . . . . . 31.
31. Abdomen distinctly punctured . . . . . **cressoni.**
Abdomen not so . . . . . **asteris.**
32. Clypeus maculated with yellow. . . . . **bradleyi** n. sp.

Andrena (*Trachandrena*) *alleghaniensis* Vier.

" (*Trachandrena*) *crataegi* Robt. Sure to be found throughout the State.

" (*Trachandrena*) *daeckei* Vier. May be found in Connecticut along the Sound. Type locality Clementon, New Jersey.

" *nivalis* Sm. (=*A. pruni*=*A. dunningi*=*A. viciniformis*=*A. convexa*=*A. viburnella*). Throughout the State.

" *placida* Sm. (=*A. salicacea*=*A. macilenta*=*A. macgillivrayi*). This is no doubt generally distributed throughout the State.

" *erythrogaster rhodura* Ckll. Type locality Hartford.

Andrena cornelli Vier. Type locality Ithaca, N. Y.

" *flavoclypeata* Sm. (= *A. bipunctata* of authors = *clypeata* = *clypeolata*). No doubt occurs throughout the State. It is one of the important pollinizers of apple, pear and other fruit blossoms.

" *robertsoni* D. T. (= *A. serotina*). Occurs with the preceding species, but is not so common.

" *arabis* Robt. This appears early in spring.

" *nubecula* Sm.

" *distans* Prov.

" *canadensis* D. T. (= *simulata*).

" *gerani-maculati* Robt.

" *fragilis* Sm. (= *platyparia* = *laticeps* = *provancheri*).

" *integra* Sm. (= *lineata*).

" *solidaginis* Robt. Late in summer and early in fall this species may be seen visiting the flowers of the goldenrod.

" *pulchella* Robt.

" *vestita* Prov. (= *nasoni* = *hartfordensis*). This is one of the pollinizers of fruit blossoms.

" *novae-angliae* Vier.

" *mandibularis* Robt. (= *thaspi*). This visits fruit blossoms and azalea flowers.

" *cockerelli* Graen.

" *hirticincta* Prov. (= *americana* = *fimbriata*). Visits flowers of the goldenrod and other flowers of late summer and early fall.

" *milwaukeensis* Graen.

" *winkleyi* Vier. Type locality Branford. Visits flowers of quince, raspberry and possibly other fruits.

" *davisi* Vier.

" *commoda* Sm. (= *corni*).

" *cressoni* Robt.

" *hilaris* Sm.

" *vicina* Sm. Visits flowers of some of the fruit trees.

" *carlini* Ckll. Occurs with the preceding.

" *andrenoides wellesleyana* Robt. Visits the willow.

" *pennsylvanicola* Vier.

" *helianthi* Robt. Visits the sunflower.

" *braccata* Vier. Visits goldenrod flowers.

" *angusi* Vier.

" *asteris* Robt. Received its name from its habit of visiting flowers of the aster.

" *rehni* Vier.

" *forbesi* Robt.

" *mariae* var. *concolor* Robt.

" *mariae* Robt.

Andrena weedi Vier.
" *obscura* Robt.
" *hippotes* Robt.
" *multiplicata* Ckll.
" *spireana* Robt.
" *multiplicatiformis* Vier.
" *rugosa* Robt.
" *paenerugosa* Vier.
" *bradleyi* Vier. Visits flowers of the gooseberry, *Ribes oxyacanthoides* and huckleberry flowers, *Galussacia*.

List of Tachinidae taken in the City of Philadelphia.

By H. S. Harbeck.

In the northern part of the City of Philadelphia, Pa., is a number of small woods that so far have been saved from devastation, but which I presume in a short time will be cut down to make ready for improvements. In such places I have found the very best kind of collecting for Diptera.

To enumerate all the specimens collected would take up too much space of this Journal, but to give an idea of the excellent collecting to be had in these places, I give a list of the species of one family, the Tachinidae, which I have collected in the past few years.

Sixty-two species are here listed, and my thanks are due to Mr. D. W. Coquillett for the determination of most of the species and to Dr. L. O. Howard, of the Nat. Mus. for his kindness in allowing me to send my material to the Mus. for determination.

Cistogaster immaculata Macq., July 30.
Phorantha occidentalis Walk., July 2.
Myiophasia aenea Wied., Aug. 22.
Cryptomeigenia theutis Walk., May 20.
Admontia degeerioides Coq., Aug. 4.
" *tarsalis* Coq., Aug. 4.
" *nasoni* Coq., Sept. 8.
Celatoria diabroticae Shimer, Aug. 12.
Hypostena dunningii Coq., Aug. 12.
" *variabilis* Coq., Sept. 8.
" *floridensis* Town., June 10.
" *flaveola* Coq., June 4.
Macquartia pristis Walk., July 28.
Hyalomyodes triangulifera Loew., May 20.
Oestrophasia signifera V. d. Wulp., May 9.

Epigrimyia floridensis Town., Aug. 12.
Cyrtophloeba horrida Coq., April 21.
Plagia americana V. d. Wulp., July 6.
Distichona auriceps Coq., Sept. 24.
Senotainia trilineata V. d. Wulp., Aug. 12.
Belvosia unifasciata Desv., Sept. 24.
Linnaemyia compta Fall., Oct. 1.
Panzeria radicum Fabr., April 15.
Macromeigenia chrysoprocta Wied., July 16.
Gymnochaeta alcedo Loew., May 23.
Exoristoides slossonae Coq., June 21.
Exorista blanda O. S., Oct. 1.
" *eudryae* Town., July 28.
" *confinis* Fall., July 28.
" *nigripalpus* Town., July 30.
" *lobellae* Coq., June 12.
" *ceratomiae* Coq., July 28
Euphorocera claripennis Macq., July 12.
" *cinerea* V. d. Wulp., April 15.
Phorocera leucaniae Coq , April 21.
Siphosturmia rostrata Coq., Aug. 26.
Acemyia dentata Coq., Aug. 2.
Tachina robusta Town., June 18.
" *mella* Walk., Aug. 21.
Winthemia quadripustulata Fabr., July 2.
Frontina setipes Coq., Sept. 24.
" *aletiae* Riley, June 18.
" *ancilla* Walk., June 26.
Blepharipiza leucophrys Wied., July 21.
Masicera eufitchiae Town., Aug. 26.
" *chaetoneura* Coq., June 14.
Hilarella fulvicornis Coq., Aug. 12.
" *polita* Town., July 30.
Metopia leucocephala Rossi., Aug. 4.
Gonia capitata De Geer, April 2.
" *senilis* Will., April 2.
Spallanzania hesperidarum Will., July 2.
Gaediopsis ocellaris Coq., Sept. 21.
Chaetogadea analis V. d. Wulp., Sept. 21.
Cuphocera fucata V. d. Wulp., Aug. 1.
Peleteria robusta Wied., June 4.
Archytas aterrima Desv., Sept. 25.
" *analis* Fabr., Oct. 1.
Echinomyia dakotensis Town., Sept. 4.
" *florum* Walk., June 10.
Epalpus signiferus Walk., May 7.

Notes and Descriptions of Hippoboscidae and Streblidae.

By D. W. Coquillett.

Ornithomyia butalis Coq.

In *Entomological News* for March, 1907, (p. 103), Dr. Speiser expresses his belief that this species is synonymous with *avicularia* Linné. Besides the great difference in color, the two forms are readily separable by the venation; in *butalis* the apex of the second basal cell is slightly nearer to the apex of the anal than to the small crossvein; in *avicularia*, two European specimens of which are before me, the second basal cell is prolonged almost to the small crossvein, the distance never much exceeding the length of that crossvein.

Ornithomyia anchineuria Speiser (*pallida* Say, 1823, not Olivier, 1811).

Nine specimens from localities ranging from Washington, D. C., to California, agree so well with Say's description as to leave no doubt in regard to their belonging to his species; I am unable to distinguish them from European specimens of *avicularia* Linné and believe that they belong to this holarctic species. In some of the specimens the crossvein at the apex of the second basal cell is practically interstitial with the small crossvein, as Say described it, but the position of this crossvein is variable in the different specimens.

Lynchia brunnea Olivier.

Dr. Speiser refers this species to the genus *Lynchia* with a query, but since the form which the writer independently identified as this species belongs to the present genus, and moreover since Olivier's description applies to this species better than to any other form which occurs in our fauna, there would seem to be no need for the query.

Lipoptena subulata n. sp.

Near *depressa* Say but larger, with a fasciate abdomen and a stout black spine at the apex of the inner side of the front tibiæ. Head yellowish, middle of the front opaque brownish, the broad orbits

polished and becoming blackish posteriorly, an elongate-oval, transverse, black ocellar spot and a pair of black spots between the antennæ. Thorax brown, the anterior part and the scutellum yellowish. Abdomen black, the base reddish yellow, the medio-dorsal region marked with a pale yellow triangular spot, followed by two fasciæ of the same color, the second one at its ends usually prolonged to the hind end of the abdomen; venter black laterally, the middle pale yellow; just before the anal opening in the female is a transverse row of three small chitinized brown spots. Legs light yellow; front and middle tibiæ devoid of spines, except at their apices, the front ones with a stout black apical spine reaching to apex of second tarsal joint, the middle tibiæ with a long, black spine and a second spine about one-half as long; hind tibiæ bearing a row of three along the inner side and a crown of four at the apex. Length 4 to 5 mm.

Woodstock, N. H. Six females and one male collected on deer in November, 1905, by Mr. John P. Long. Type No. 10,292 U. S. National Museum.

The form here considered as being *depressa* is represented in the National Museum by a fine series of specimens collected on a blacktailed deer by Mr. H. S. Barber, in Humboldt county, Cal. The habitat of Say's specimens is not at present known; in the original description he simply stated that this species "Inhabits *Cervus virginianus,*" a kind of deer which, as at that time understood, ranged from the Atlantic to the Rocky Mountains. In the introductory remarks in the paper which contains his description of *depressa* he stated that the Diptera described therein "were chiefly collected by myself during the late expedition to the Rocky Mountains under the command of Major Long." It is altogether probable, therefore, that the specimens were obtained from a deer shot by one of the members of the expedition at some point between Arkansas and the Rocky Mountains. That it should also be found in northern California is not an improbable occurrence.

Aspidoptera busckii Coq.

This is given by Speiser as a synonym of *phyllostomatis* Perty, but is readily distinguished by the fact that the tibiae are only pubescent, while in *phyllostomatis,* four Brazilian specimens of which are before me, the tibiae are fringed with comparatively long bristly hairs.

METELASMUS n. gen. of Streblidae.

Near *Strebla* but the wings reduced to somewhat oval pads less than half as long as the thorax. Head depressed, somewhat bell-shaped, fringed around the margins with setae, the posterior end fringed with flattened spines below, at the sides and on the hind angles of the upper side; no antennæ, eyes or ocelli. Thorax somewhat injured in the single specimen

Metelasmus pseudopterus Coquillett.

before me, but apparently of the form shown in the figure; sternum sparsely covered with short, bristly hairs and fringed with setæ around the front end, medium sulcus three-branched posteriorly. Abdomen and legs as in the figure. Type, the following species:

Metelasmus pseudopterus n. sp.

Head brownish yellow, a transverse pair of pale yellow spots near the middle; body dark yellow, legs pale yellow; aborted wings dark yellow and with a pale yellow costal spot before the middle of each; spines and bristles, like the tarsal claws, black; length 2.5 mm.

Sapucay, Paraguay, South America. A single specimen collected on a bat, *Artibius lituratus*. Type No. 10293. U. S. National Museum.

The Bees of Nebraska.—III.

By MYRON H. SWENK.

Family MACROPIDAE.

Genus **MACROPIS** Panzer.

1. **Macropis patellata** Patton.

Meadow, Nebraska, July 14, 1906, three males collected at a small white *Asclepias* (P. R. Jones).

2. **Macropis clypeata** n. sp.

♂.—Length 7 mm.; apparently very close to *M. morsei* Rob., but differing from the description of that species as follows: Pubescence of mesonotum pale and black intermixed, the dark hairs predominating only on the disk; only the clypeus yellow, the spots on the sides of the face and on mandibles lacking; wings smoky, the nervures and stigma black; tarsi wholly black; first two abdominal segments scarcely depressed apically and not fasciate.

Type—Warbonnet Canon, Sioux County, Nebraska, July 13, 1901, on *Pentstemon* (M. Cary). ♂.

Differs at once from *ciliata, patellata* and *steironematis* in the face marks and size.

Family DUFOUREIDAE.

Genus **HALICTOIDES** Panzer.

1. **Halictoides marginatus** Cresson.

Entire State (Lincoln, West Point, Neligh, Long Pine, Gordon, Bridgeport, Crawford, Glen and Warbonnet Canon), flying in great abundance at the flowers of the various species of *Helianthus,* and also on *Grindelia squarrosa, Solidago rigida, Convolvulus* sp. and *Carduus altissimus,* on the three last named flowers but rarely. In eastern Nebraska the season of flight is from August 7 to September 18, in Sioux County somewhat earlier, from June 26 to August 29.

2. **Halictoides maurus** Cresson.

Sioux County, Nebraska, June 13-28, at flowers of *Campanula petiolata.*

Family NOMIIDAE.

Genus **NOMIA** Latreille.

1. **Nomia foxii** Dalla Torre.

Lincoln, West Point and Dundy County, Nebraska, May 31 to July 12 at flowers of *Petalostemon violaceus.*

2. **Nomia nortoni** Cresson.

Lincoln, Nebraska City, Union and Harvard, Nebraska, June 9 to September 14, at flowers of *Solidago rigida, Grindelia squarrosa, Cassia chamaechrista* and *Petalostemon violaceus.*

Genus **EUNOMIA** Cresson.

1. **Eunomia heteropoda** Say.

West Point and Ord, Nebraska, August.

2. **Eunomia apacha** Cresson.

Sioux County, Nebraska, a single female specimen taken.

Genus **EPINOMIA** Ashmead.

1. **Epinomia triangulifera** Vachal.

Lincoln, Nebraska City and Cedar Bluffs, Nebraska, August 4 to September 18 at flowers of *Helianthus annuus, Grindelia squarrosa, Polygonum hydropiper* and, less commonly, on *Solidago rigida* and *Vernonia* sp. also. This species has formed a large colony on the salt flats west of Lincoln.

Family BOMBIDAE.

Genus **BOMBIAS** Robertson.

1. **Bombias separatus** (Cresson).

This species is abundant over the entire State. Specimens before me are from Lincoln, Omaha, Beatrice, South Bend, Weeping Water, Nebraska City, West Point, Neligh, Niobrara, Springview, Gordon and Sioux County. The females commence to fly in late April, principally upon the flowers of *Prunus, Salix, Ribes, Rubus, Malus, Astragalus* and *Lonicera;* the workers appear in numbers during the third week in June, visiting during the summer and fall the flowers of *Petalostemon, Psoralea, Verbena, Symphoricarpos, Monardia, Cassia* and *Solidago;* the males are abundant during September and October on *Carduus* and *Helianthus.*

2. **Bombias scutellaris** (Cresson).

Of our three common eastern Nebraska *Bombias* this species is the least plentiful. It is present over the entire State, but is more common eastwardly, having been captured at Lincoln, Omaha, Nebraska City, West Point, Carns and in Sioux County. It flies from early June to early October, chiefly on *Petalostemon, Carduus, Helianthus, Solidago* and *Grindelia.*

3. **Bombias auricomus** Robertson. (= *pennsylvanicus* Cresson, ♂, ♀, ☿, in part.)

Probably the entire State, but rare westwardly, and not yet taken in Sioux County. Many specimens from Lincoln, Omaha, South Bend, West Point, etc., and a single worker from Dundy County in June on *Carduus* (M. H Swenk). Next to *separatus* this is our most common *Bombias*. The females begin to fly in early May and from then to early October, visiting the flowers of *Ribes, Astragalus, Fragara, Rubus, Antirrhinum* and *Carduus*.

4. **Bombias nevadensis** (Cresson).

This is essentially a species of the Transition zone, but it straggles south along the western edge of the State to Dundy County, and east along the northern edge to West Point. It abounds in Sioux County, flying from May to September, visiting commonly the flowers of *Astragalus, Malvastrum, Cleome, Monarda,* etc. Cresson's *Bombus improbus* is undoubtedly the male of *nevadensis*.

5. **Bombias morrisoni** (Cresson).

A strictly Transition species, only rarely descending even to the more elevated portions of this State. We have two worker specimens, one taken in Warbonnet Canon, Sioux County, July 21, the other at Gering, Nebraska, in August.

6. **Bombias rufocinctus** (Cresson).

Sioux County (Glen, Harrison, Pine Ridge), July and August, 3 females, 11 workers and 1 male. Also a single male from West Point, Nebraska.

7. **Bombias edwardsii** (Cresson).

A worker bumblebee captured in Warbonnet Canon, Sioux County, July 23, 1901 on *Verbena* (M. A. Carriker), is apparently a variety referable to this species, though not typical of it.

Genus **BOMBUS** Latreille.

1. **Bombus proximus coloradensis** Titus.

Warbonnet Canon, Sioux County, July 1, 1901 (L. Bruner), one female specimen.

2. **Bombus pennsylvanicus** (De Geer). (=*fervida* Fabricius.)

Present over the entire State, but common only in the higher parts, especially in Sioux County, where it is abundant from the middle of May to the middle of September. Eastward, it has been captured at Lincoln, Omaha, Weeping Water, West Point, Neligh, Springview and Gordon. It has been taken principally on *Astragalus, Rubus, Petalostemon, Monarda, Mentha, Carduus, Solidago* and *Helianthus.*

3. **Bombus americanorum** Fabricius.

Distributed as *Bombias auricomus,* which it so much resembles but everywhere more common, probably our commonest *Bombus.* Lincoln, Omaha, South Bend, Cedar Bluffs, Weeping Water, Nebraska City, West Point, Neligh, Broken Bow and Brown, Rock and Hitchcock Counties. Not yet captured in Sioux County. Season as that of *Bombias auricomus.* Our plant records for this species include *Astragalus, Rubus, Malus, Petalostemon, Verbena, Carduus, Cassia, Psoralea, Monarda, Solanum, Vernonia, Solidago, Carduus* and *Helianthus.*

4. **Bombus virginicus** (Olivier).

Eastern Nebraska, common. Specimens are from Lincoln Omaha, South Bend, Cedar Bluffs, Weeping Water, Meadow, Nebraska City, Falls City and Nemaha City. This is the first *Bombus* to appear in the spring, flying about April 20 on *Prunus* and *Ribes.* Later it is found commonly on *Rubus, Cassia* and *Petalostemon.*

5. **Bombus ridingsii** Cresson.

South Bend and Omaha, May 17-20 on *Rubus occidentalis,* several female specimens. We have never taken workers or males in the State.

6. **Bombus consimilis** Cresson.

Entire State, specimens from Lincoln, Omaha, South Bend, Weeping Water, Meadow, Cedar Bluffs, West Point, and Sioux County. Found principally on *Rubus, Lonicera* and *Petalostemon.* All of our old Nebraska records of *B. vagans* refer to this species.

7. **Bombus huntii** Greene (=*ternarius* of authors, in part.)

This handsome species is confined to the Pine Ridge country in Sioux County, where it flies abundantly from late May to September, visiting *Astragalus, Symphoricarpos, Campanula, Borago, Melilotus, Monarda, Cleome, Carduus* and *Helianthus.*

8. **Bombus juxtus** Cresson.

Distributed as *B. huntii,* but much less common, having the same season and visiting the same plants.

Genus **PSITHYRUS** Lepelletier.

1. **Psithyrus variabilis** (Cresson).

Our commonest *Psithyrus.* Lincoln, Ashland, Seward and West Point, May to October, found on *Rubus, Verbena, Liatris, Bidens, Solidago* and *Carduus.*

2. **Psithyrus laboriosus** (Fabricius).

Two specimens, a female from Lincoln taken in August, 1893, and a male from West Point taken September 19, 1887. This species is much closer to *P. latitarsus* Morrill than is *P. insularis,* with which he compares it.

3. **Psithyrus insularis** (F. Smith).

Found only in Sioux County, from which we have a female and two male specimens.

Family MELECTIDAE.

Genus **NEOLARRA** Ashmead.

1. **Neolarra verbesinae** Cockerell.

One ♀ specimen, Warbonnet Canon, Sioux County, Nebraska, July 23, 1901, on *Helianthus* (M. Cary).

Genus **NEOPASITES** Ashmead.

1. **Neopasites illinoiensis** Robertson.

Lincoln, West Point, Cedar Bluffs and Omaha, Nebraska, June 20 to September 11, on *Solidago rigida* and *Grindelia squarrosa* in the fall, and on *Ratibida columnaris, Symphoricarpos occidentalis* and *Asclepias* sp. in the summer. This species has been found in the nests of *Calliopsis andreniformis* at both Omaha and West Point.

2. **Neopasites heliopsis** Robertson.

Lincoln, West Point, Springview and Warbonnet Canon, Sioux County, Nebraska, June 21 to September 11, on *Solidago rigida, Grindelia squarrosa* and *Aster* in the fall, and on *Senecio* in the summer.

3. **Neopasites robertsoni** Crawford.

I took several specimens of this species August 27, 1902, on *Solidago rigida* along with *N. heliopsis,* which was much more abundant. Mr. Crawford records it from West Point, August 30, 1903 on the same flower.

Genus **MELECTA** Latreille.

1. **Melecta interrupta** Cresson.

Warbonnet Canon, Glen, Long Pine and West Point, Nebraska, June 30 to August 16 at flowers of *Cleome serrulata, Petalostemon violaceus* and *Monarda* sp.

2. **Melecta miranda** Fox.

The preceding species is characteristic of the Transition zone and is replaced in the Upper Sonoran by this species. Lincoln, Weeping Water, Glen and Gering, Nebraska, season and flowers the same as for *interrupta;* also found occasionally upon flowers *of Helianthus annuus.*

Genus **BOMBOMELECTA** Patton.

1. **Bombomelecta pacifica** Cresson.

Warbonnet Canon, Monroe Canon and Halsey, Nebraska, May 28 to June 6, flying at flowers of various species of *Astragalus.*

VIERECKELLA new genus.

Labial palpi 4-jointed, as long as glossa, two basal joints long and flattened, two distal joints short and sub-cylindrical, proportionate length as 10.5: 6: 1.7: 1, Maxillary palpi 5-jointed, the first four joints elongate and cylindrical, the basal joint thickest, joint 2 slightly more slender and much longer, joint 3 subequal to but more slender than 2, 4 about two-thirds as long as 3, joint 5 extremely minute, visible only upon close microscopic scrutiny. Glossa long, one and one-half times as long as the mentum, lanceolate. Mandibles with a deep

external tooth, inserted before middle of eye. Marginal cell at apex rounded, widely separated from costa, nearly as long as the combined three submarginals but distinctly shorter than the first discoidal cell. Submarginals three, subequal in length along the cubitus, first one trapezoidal, second slightly narrowed above, third narrowed about one-third. First transverse cubital nervure straight, second slightly curved, third bulging strongly out toward apex of wing. First and second recurrent nervures joining second and third submarginal cells respectively near their apices. Median cell much larger and nearly twice as long as the submedian. Discoidal nervure much longer than the sub-discoidal nervure. Stigma medium-sized, well developed. Scutellum bilobed. Legs stout, simple. Claws with a short inconspicuous internal tooth. Tibial spurs short and stout, only one on middle tibiæ, dark testaceous and microscopically pectinate. Abdomen short, conical, segment 6 of ♀ exerted, elongate acuminate, with a distinct pygidial area.

Viereckella obscura n. sp.*

♀.—Length 10 mm.; shining black, nearly bare. Head coarsely punctured, very shallowly on clypeus and cheeks, deeply so on front, the sides of vertex finely punctured. Supraclypeal area elevated, continuous with a median carina between bases of antennæ. Antennæ black, scape finely punctured, the flagellum testaceous beneath, joint three decidedly shorter than four. Labrum shining, punctured like the front. Mesonotum shining, coarsely and closely punctured, no well-defined discal space, scutellum and pleura similarly but more coarsely punctured, postscutellum opaque, irregularly reticulate. Metathorax with a smooth, shining, almost impunctate basal triangle, elsewhere punctured like mesonotum. Tegulæ large, shining black, finely punctured. Wings heavily darkened, nervures and stigma black. Basal abdominal segment subimpunctate, except laterally, following segments feebly and mostly indistinctly punctured, the margins of the segments not depressed. Pubescence short, sparse, pale grayish white, except that on tibiæ and tarsi, which is largely black, and that on the inner surface of the tarsi which is orange, longest on pleura, scutellum and postscutellam. The abdomen has very loose thin lateral fasciæ on apices of segments 1-5, and segments 4-6, bear some black bristles ventrally.

♂.—Unknown.

*A second species of the new genus occurs in Virginia.

Type—Meadow, Nebraska, July 14, 1905, (P. R. Jones). ♀.

In Ashmead's tables this bee runs to *Aglae* Lep. or *Leiopodus* Smith. To the former it is but distantly related, but to the latter it is fairly close, differing radically, however, in the comparative lengths of the palpal joints. From the type species of *Leiopodus* this species differs in the lack of depression on mesonotum, dark wings, lack of abdominal maculæ, etc. I take pleasure in dedicating this remarkable new genus to Mr. H. L. Viereck, in recognition of his valuable contributions to the study of North American bees.

Viereckella ceanothina Ckll., n. sp.

♀.—Similar to the typical species, but smaller (length less than 8 mm.); wings only moderately dark, darkest apically, second submarginal cell small, subtriangular, being much narrowed above, very much shorter above and below than the first or third; flagellum beneath dark coffee brown, except its first joint, which is red; hair of tibiæ white. Runs nearest to *Leiopodus* in Ashmead's table. I examined the type of *Leiopodus* in the British Museum (see Trans. Am. Ent. Soc. XXXI, 316) and it is a decidely different insect. The hind coxæ are large and long, while in our insect they are normal, though rather large; the b. n. falls a considerable distance short of t. m.; in our species they meet. The shape of the second s. m. is entirely different.

Habitat.—Falls Church, Va., June 14, at flowers of *Ceanothus*. (*Nathan Banks*)—T. D. A. COCKERELL.

Lycaena emigdionis Brennell.—Mr. Fordyce Grinnell described, in ENTOMOLOGICAL NEWS, April, 1905, a male and female of a *Lycaena*, which he called *emigdionis*. His specimens were taken in San Emigdio Canon, Kern County, California, in June. Mr. W. G. Wright, in Butterflies of the West Coast, page 226, redescribed the species, giving it the name *melimona* "from both of its supposed parents" (*melissa* and *acmon*.) All his specimens were females and were taken in one locality in the San Bernardino Mountains in June. He found *acmon* prevailing there in May, *melimona* in June, and *melissa* in July. The larval foodplant of *emigdionis* is *Hosackia purshiana*. Specimens sent by Mr. Wright to W. H. Edwards were said to be "only a variety of *acmon*." He has never taken the male. A later examination of Mr. Grinnell's specimens proves them to be all females, and, as Edwards said, *emigdionis* is probably only a variety of *acmon* and the synonymy will be *Lycaena acmon* Boisd. Var. + *emigdionis* Grinnell, *melimona* Wright. —CARL R. COOLIDGE.

Notes on Histeridae.

By CHARLES SCHAEFFER, Brooklyn, N. Y.

Hololepta pervalida Blaisd.

This is a valid species and distinguishable from all the North American as well as the Mexican species of the subgenus *Lioderma*, as far as known to me, by the possession of a transverse marginal line at base of elytra. This impressed line is a continuation of the two striæ along the basal margin and generally extends to the scutellum. The form is narrower and more parallel than *yucateca;* the apical fovea of the thorax in *yucateca* is very near the apical angles, while the fovea in *pervalida* is separated from the apical angles by twice or three times the width of the side margin, the space between the fovea and the apical angle with confused, short striæ. The median ridge of the underside of the front tibiæ is smooth and not interrupted in *yucateca*, but is interrupted, or rather three—or four—dentate in *pervalida.*

Mr. George Franck received a great number of specimens from Pasadena, which I take to be this species. The description is very poor, hardly anything is given to differentiate this species from *yucateca*, except that it is said to be "strongly oblong, narrower and much less depressed than *yucateca,*" which applies well to the Pasadena specimens, but also to *grandis* Mars., which Marseul himself placed as a synonym of his *yucateca.* In the description of *grandis* there is, however, no mention made of the transverse marginal stria at base of elytra, which could not have been overlooked.

Major Casey, who seems to have seen the type of *princeps* Lec., states that this is a distinct species, but gives nothing to differentiate it from *yucateca* Mars. It may be that *pervalida* is the same as *princeps,* in which case the latter name has to be used for this species.

I found *Hololepta yucateca* near Brownsville, Texas, in the decaying trunks of *Yucca treculeana; vernicis* in the decaying flower stalks of *Agave americana?* in the Huachuca Mountains, Arizona, and *cacti* in the half-decayed leaves or rather stems of *Opuntia engelmanni* near Brownsville and Hidalgo, Texas.

Hololepta vernicis Casey.

In the Huachuca Mountains, Arizona, I took a small number of specimens of a *Hololepa,* which agree in every respect with the description of this species. It is also a good species and not synonymous with *yucateca.* The specimens are always much smaller than *yucateca,* about the size of *cacti,* but more elongate; the lateral thoracic groove is narrow and deeply impressed, and scarcely becomes wider near apical angles; near the latter in the male is a deep circular fovea, which is absent in the female; the supra-orbital striæ are in all my specimens short, basal. The description of the Mexican *polita* Mars. fits the males of *vernicis* Casey very closely, in fact, there is hardly anything in the description which does not agree with my Arizona specimens, except that the subhumeral stria does not extend quite to the base in my specimens. The two will have to be united if there are not other characters present to separate them.

Hololepta (*Lioderma*) **beyeri** new species.

Male.—Form and size of *cacti* Lec., but slightly narrower, black, shining. Mandibles elongate, feebly curved at apex, suddenly dilated inside at about basal third, above the dilatation, one obtuse tooth, surface finely punctulate. Head sparsely, rather coarsely punctate with some finer punctures intermixed; anteocular tooth indistinct; supra-orbital striæ distinct. Thorax deeply emarginate at apex; sides feebly arcuate; lateral striæ deeply impressed, but not broad, continued along basal margin for a short distance; at sides, slightly below apical third a deep transverse groove, above and below this a smaller one, which two are more or less connected with each other by the marginal stria; near apical and basal angles the surface is moderately coarsely punctate, disk smooth, with an impressed median line, which does not extend to apex. Elytra as broad as the thorax at base; subhumeral groove deeply impressed, not extending to base nor apex, coarsely, sparsely punctate; first dorsal stria short, basal, deeply impressed, below this a row of more or less distinct fine punctures; second stria deeply impressed, entire, around which are a few coarse punctures at apex. Propygidium rather coarsely punctate, punctures sparser at middle and finer and denser at apex; pygidium more densely punctate not margined. Labrum obtusely carinate on each side, and rather acutely emarginate at middle. Prosternum convex, strongly compressed and carinate in front of anterior coxæ, acute at apex, broadly dilated and flat behind. Anterior and middle tibiæ quadridentate,

posterior tridentate, teeth of middle and hind tibiæ long and acute, except the basal tooth on middle tibiæ, which is small. Length, from apical margin of thorax to apex of elytral suture, 8.5 mm.

Habitat.—Santa Rosa, Lower California.

I take great pleasure in dedicating this interesting species to my friend, Mr. Gustav Beyer, to whom we are indebted for this and many other additions to our fauna.

The lateral transverse grooves of thorax and the basally dilated mandibles distinguish this species from any of those known to occur within our fauna. The Mexican *dorcoides* has the thorax similarly grooved, but the mandibles have a blunt tooth at base and are serrulate inside, while in *beyeri* the mandibles are broadly dilated at base with one obtuse tooth above the dilatation, the apical part of the inner edge above the tooth is smooth, showing no sign of irregularity in any of the specimens examined.

The presence of a supra-orbital stria, which is used by Dr. Horn in his synoptic table in separating *yucateca* and *cacti* from the rest of our species is in these fairly constant, but is variable in length in *pervalida* and short, basal in *vernicis*, but also visible at base in *quadridentata* and *vicina*, while in *fossularis, lucida* and *populnea* not the slightest trace can be found. The three last mentioned species have above each eye an almost semi-circular, fovea-like distinct impression, the form is more depressed and the prosternum broad and flat. They belong to *Hololepta proper*, while the rest of our species belong to the subgenus *Lioderma*. These latter have instead the fovea-like impression, a slightly depressed, coarsely punctured space above each eye, from which the supra-orbital striæ start.

Th labrum in *quadridentata* is said to be carinate, which is not quite correct. The greatest part of the labrum at middle is deeply depressed, especially in front, consequently the sides being more elevated, from a certain point of view, give the appearance of being carinate on each side.

Table of the Species of **Hololepta.**

First and second elytral striae continued along basal margin forming a basal stria, which generally extends to the scutellum.

pervalida Blaisd.

Elytra without transverse marginal striae at base . . . . . 2.

1. Pygidium distinctly margined ; labrum longitudinally carinate on each side ; lateral margin of thorax generally interrupted at middle, but grooved or foveate except near apical angles in the male. **cacti** Lec.

Pygidium not margined . . . . . 3.

3. Thorax near side margin, slightly below apical third, deeply transversely grooved, above and below this a smaller, but deeply impressed fovea, the one about middle, connected with the median groove by the marginal groove ; mandibles more or less suddenly dilated at about basal fourth and with a more or less distinct tooth above the dilatation ; labrum obtusely carinate on each side ; prosternum strongly carinate in front, broadly dilated behind . . . . . **beyeri** n. sp.

Thorax near side margin below apical third not grooved, mandibles not dilated at basal fourth . . . . . 4.

4. Head on each side above each eye with a fovea-like distinct impression ; no supra-orbital striae . . . . . 10.

Head on each side above the eyes feebly depressed, coarsely punctate and with a more or less distinct supra-orbital stria, which is in some species greatly abbreviated and visible at base only . 5.

5. Labrum longitudinally carinate on each side ; outer carina of underside of middle and hind tibiae denticulate . . . . . 8.

Labrum not carinate, outer carina on underside of middle and hind tibiae not denticulate . . . . . 6.

6. Median carina on underside of front tibiae without, or with one, tooth like elevation at apical fourth . . . . . 7.

Median carina of underside of front tibiae with several tooth-like elevations at apical half . . . . . 9.

7. Thorax at apical margin, on each side of the emargination, with a short impressed transverse line ; sides of thorax near marginal groove not punctate ; lateral groove of thorax relatively broad; strongly widening towards apex and terminating here in a more or less distinct fovea-like impression in both sexes. **yucateca** Mars.

Apical margin of thorax without short, impressed line on each side of emargination ; sides of thorax near lateral margin, moderately coarsely punctate from base to apex ; lateral groove of thorax narrow, deeply impressed and of nearly equal width throughout, terminating in a very deep, rounded fovea in the male, the fovea absent in the female ; supra-orbital stria short, basal . . . . . **vernicis** Casey

8. Mediun carina on underside of front tibiae feebly dentate near apical fourth ; supra-orbital stria short, basal ; head without frontal stria ; elytra with inner stria entire, outer short, basal ; supra-orbital stria short, basal . . . . . **quadridentata** Fab.

9. Head in front with two arcuate impressions, which are sometimes connected; thorax punctate at sides; elytra with inner stria entire, outer short, basal; supra-orbital stria short, basal. **vicina** Lec.

10. Elytra with outer stria entire, inner short basal; prosternum feebly convex, broadly arcuate in front . . . . . **lucida** Lec.

Elytra without entire striae; prosternum flat, broad and truncate at apex . . . . . 11.

11. The two striæ on each elytron, short, basal, the inner without apical appendage . . . . . **fossularis** Say.

The inner elytral stria with apical appendage, the outer short, basal. **populnea** Lec.

Hololepta neglecta Blaisd., described in Zoe, Vol III, p. 338, is unknown to me and not included in the above table, as nothing tangible could be found in the poor description to differentiate this from the allied species.

Omalodes grossus Mars. (*texanus* Mars, *lubricans* Casey.)

The principal difference between *grossus* and *lubricans* consists in the punctuation of the pygidium and propygidium, which are in *grossus* coarsely punctuate at sides only, while in *lubricans* the entire pygidium is coarsely punctuate, except in anterior third and the punctured space on each side of the propygidium connected at apex by some very fine punctures. The five specimens before me show all grades of variation in the punctuation of the two pygidia from *grossus* (Huachua Mountains, Arizona) to *lubricans* (Sta. Rita and Huachuca Mountains, Arizona).

Omalodes texanus Mars.

Is principally separated from *grossus* by having the two punctured areas at sides of the two pygidia connected at apex and the hind tibiæ tridendate. The first character, as shown above, is not constant, and an examination of the ten hind tibiæ of the five specimens before me reveals the interesting fact that the number of teeth is not alone variable, but that even in the same specimen one of the hind tibia may be tridentate and the other quadridentate, also that the distance between the first and second and second and third tooth varies greatly on the two tibiæ of the same specimen In my opinion there is very little doubt that *texanus* also has

to be placed as synonym of *grossus*. The more elongate form mentioned by Marseul as another character distinguishing the species from *grossus* seems to me purely sexual, the figures given by him of the two species do not show such great difference in form as one might expect from his description.

I found this species in the Huachuca Mountains, Arizona, in the decaying flower stalks of *Agave americana*.

Notes on Papilio ajax.

By R. R. Rowley, Louisiana, Mo.

The chrysalids of *Papilio ajax*, from larvæ fed in confinement in the summer of 1905, and kept over winter in a dry box in a closet opening into a warm room, began giving imagoes April 12th, and between that date and May 2d, seventy-nine butterflies emerged, three or four only of the original number of pupæ dying in the pupal skins. But few of the of the imagoes were deformed, and these cases were largely due to pricking the wings before their unfolding. The greatest number of "flies" emerging at one time, twenty-two, was April 22d, but from lack of proper attention in removing the pupæ about to "hatch" to different boxes, so that there would be few of the imagoes together, not many of this number were worth keeping, being badly battered and torn, although the cages were in a dark closet.

It is my custom in setting bred specimens to give the imago as long a lease on life as possible before putting it in the cyanide jar, else the wings may be too limp and the blood collect in blisters and spoil the specimen.

After the wings of a butterfly are fully expanded it is four hours or more before the insect has strength enough to fly well, and it is best to allow your specimen so much time before you kill it.

In the case of moths, after emergence, it is well to keep the cage in the light (not direct sunlight) and, as they usually "hatch" in early morning, allow them all day to fully develop, transferring them to the cyanide jar late in the afternoon, not evening, as that is their time of flight.

As stated in the article on *ajax* in the May, 1906, num-

ber of THE NEWS, the larvæ that gave me over a hundred chrysalids were gathered from June 1st to October 1st, few of the number emerging from July to October. Why so few of the chrysalids gave butterflies during the summer and autumn is a little strange, but doubtless a wise provision of nature to prevent the extinction of the species.

Another interesting observation on these *ajax* pupæ is that every one of the seventy-nine spring imagoes are of the winter varieties, despite the fact that many of them should have given summer forms last year, and all of them escaped a freezing temperature last winter.

In a majority of the specimens of the winter forms of imago, the ground color is from a pale cream on the hind wing to a light blue-green on the front wing, with cross bands of dark brown or black and a double red spot at the anal angle, separated from the two blue lunules by a cream-colored spot. In a few specimens the double red spot gives place to two separate spots. In a number of the imagoes the usual pale blue-green ground color of the front wing is replaced by a very light or pale smoky yellow.

A few specimens have the outer border of the forewing full or convex.

In specimens of the so-called variety *abbottii*, a more or less distinct crimson streak occurs on the upper side of the hind wing near the middle and just outside of the medial black band.

In one specimen this red is a distinct spot with an outer black shade line. On the first day of May, 1906, I collected twenty-three eggs and three young larvæ of *ajax*. So backward had been the spring that few of the leaves had at all opened out, and so the eggs were found on the lower side, exactly the opposite of the finds last summer and autumn. As before, they were found largely on the low, young shrubs. On May 18th, I had the first two pupæ of the summer brood, one green and one brown. Seventeen days from the emergence of the last winter imago I had the first pupæ.

After collecting the above eggs, a series of killing frosts left all exposed papaw bushes without leaves or blooms, and doubtless killed the young larvæ as well.

Of the twenty-three eggs and three small larvæ collected May the 1st, sixteen were brought to pupation, the chrysalids being of the following colors and numbers: 5 green, eight light brown, 2 red and 1 yellow. The proportional number of green ones is much greater in the first (spring) brood than in the later ones.

Throughout May and June other eggs and larvæ were collected, and the first *marcellus* imagoes from chrysalids were given June 7th. Each day thereafter to the 17th, gave a few butterflies. Stragglers continued to emerge through July, perhaps half a dozen in all. Then there seemed to be an end to the "hatching."

On September 1st another *marcellus* imago was found in the box.

There were left over sixteen pupæ from the May and June eggs and these are at this writing giving winter forms of imagoes.

Preparing Lepidoptera for the cabinet in short order.

H. H. Brehme, Newark, N. J.

It has been the custom of collectors of Lepidoptera up to the present time to spread their specimens and let them remain on the spreading boards all the way from two to six weeks.

First of all, a collector needs a lot of spreading boards and plenty of space to store them, which is inconvenient to many if not all collectors of Lepidoptera. This is not all: many of the specimens get destroyed while on the boards, losing the bodies either by mice or by destructive insects.

I also found, as other collectors undoubtedly do, that no matter how long a once papered specimen remains on the board after being relaxed, it will always spring back again in a short time; and to get it in proper shape it will have to be relaxed again, making double the work. I have been making experiments for three years in baking the specimens on the board and find it a great success.

I am now glad to let the Lepidopterists know all about

it, and they can undoubtedly save a good many specimens by following directions.

Relax the specimens well and then place the same on the board with narrow strips of tracing cloth. When the board is filled lay a strip of paper over the specimens, then cover the paper with strips of glass about one-fourth of an inch in thickness. After this is all done place the specimens in a cooking-stove oven. If the stove is red hot, ten minutes will be sufficient, if the stove is not so hot it will require from twenty to thirty minutes. The best way to test is to touch the glass with the finger; if the glass is so hot that the finger cannot remain longer than a second the specimens are done, and can be put away to cool off.

The specimens can be taken off the boards two hours after coming out of the oven. To make sure about papered specimens it is advisable to give them two bakings: bake them for ten minutes and let them cool for two hours and then put them in the oven again for another ten minutes.

With freshly hatched specimens the heat should not be so great and the door of the oven left open. The specimens should be kept in about one hour in *not* too hot an oven.

If too much heat is put on fresh specimens at once it will shrivel up the bodies.

There is absolutely no danger of the specimens being destroyed. I had boards full of specimens in the oven so long that the spreading board burned and the glass was so hot that it cracked. After the board and glass had cooled off the latter was removed and the specimens were found in perfect condition.

This will be a great help to collectors of Geometridæ, as these species will always sag the wings when prepared in the usual way; but if the specimens are baked properly they will never sag or spring back. This method will save both time and spreading boards, as the specimen can be placed in the cabinet the same day on which it is spread, and will remove all danger of specimens being destroyed while on the boards, and no re-spreading will be required.*

* This method is not new.—EDS.

A new Geometrid Moth from California.

By Geo. W. Taylor, Wellington, B. C.

In Dr. Hulst's Classification of the Geometrina of North America he instituted the genus *Enchoria* describing at the same time as the type a Californian moth under the name *Enchoria osculata*.

This is a very distinct, and I think, a rather rare species. I saw several not long ago in the cabinet of Mr. H. H. Lyman, of Montreal. They had been collected in Southern California by Morrison, and Mr. Lyman very kindly gave me one of them for my own cabinet. *E. osculata* might just as well be placed in *Hydriomena*, and I question whether the genus *Enchoria* is worth retaining.

In Dr. Hulst's latest list of Geometrids (in Dyar's catalogue) he associated a second species with *E. osculata*, under the name *Enchoria albifasciata* Packard. This (judging from the reference given) is intended to be the *Hypsipetes albifasciata* which Packard described in the Sixth Report of the Peabody Academy of Sciences (1874), page 41, and which had previously been figured on Plate I, Vol. XVI of the Proceedings of the Boston Society of Natural History.

The description is repeated in the Monograph, page 97, and a figure of a typical specimen is given on Plate VIII, Fig. 34, but in this publication Packard treats the insect as a variety of *Hydriomena sordidata*.

I have always been puzzled to know how Hulst came to associate together two such dissimilar insects, but recently I have found an explanation. Mr. Grossbeck has kindly sent me a photograph of the insect standing in Hulst's collection as *E. albifasciata*, and it appears that it is not Packard's species at all, but an undescribed species which I should prefer to place in the genus *Mesoleuca*.

Before describing this moth let me point out that that Packard's species is so well described and figured that there can be no doubt as to the form he had before him. I have specimens from San Luis Obispo, California, and am inclined to give the moth specific rank, but in any case it is not a variety of *sordi-*

data. It is very close to *H. reflata* Grote, and if the two are not distinct then it is *reflata* that must be dropped as a synonym of *albifasciata*.

The *albifasciata* of the Hulst collection I will describe as follows:

Mesoleuca hulstata new species.

= *Enchoria albifasciata* Hulst as of Packard, not *Hydriomena albifasciata* Packard.

Palpi rather large and stout. Head and thorax gray with many brown and a few black scales. Thorax tufted slightly both anteriorly and posteriorly, the tufts in each case being apparently double. Abdomen of female very short, of the same color as the thorax, except the terminal segment which is wholly white; each brown segment is edged behind with a fine white line. Fore wings with the basal two-fifths brown, like the thorax, with darker lines. At the extreme base is a conspicuous dark spot on median vein; basal line curved, followed by a dark band, limited outwardly by an acutely scalloped line; next is a paler band followed by another dark one, which is bounded on both sides by still darker wavy lines. The outermost of these lines (which is the intra-discal line) is sometimes edged within with whitish. The discal space is pure white, narrowest at the costa, widening out opposite the discal spot (which is round, black and conspicuous) and narrowing again to the inner margin when the moth is at rest and the inner margin of the fore wing is laid parallel to the abdomen, the white terminal segment of the latter exactly corresponds with the white median space of the wing. The extra discal band is brown, darker towards the costa and limited outwardly by a distinct wavy line which runs inwardly towards the discal spot, between veins 5 and 6, making a conspicuous sinus as in *Mesoleuca hersiliata*. The extra discal band is followed by a more or less distinct white line sometimes wide enough to be styled a band; from this, between veins 3 and 4, a whitish patch extends to the outer margin of the wing. Submarginal space dark brown, divided by an interrupted white scalloped submarginal line. The scallops between veins 4 and 5, 5 and 6, and 6 and 7 are marked on both sides of the line by dark brown spots. There are similar spots between veins 1 and 2 and 2 and 3. Marginal line brown, broken into dots. Fringe pale, basally with darker median line and spots opposite the ends of the veins. Hind wings almost clear, though in my freshest specimen there is a brown clouding at the apical angle and slight indications of 2 dusky submarginal lines. Marginal line and fringe as on fore wings. Underside lightly scaled with very faint reflections of the markings of the upper side, the indented extra-discal line and the discal spots on all wings being most evident. Expanse 25–30 mm.

Described from 7 females received from Claremont, California, through the kindness of Prof. C. F. Baker. There is one

male from the same locality which differs in being much darker and in having the central white band reduced to a white blotch surrounding the discal spot, with 2 or 3 white ringlets below. I am not sure, however, that this insect is the proper partner of the females described above. In general appearance this species resembles a pale specimen of *Hydriomena basaliata* Walker (western form), but the conspicuous white median band is distinctive.

List of 110 species and varieties of Butterflies taken by the Members of the St. Louis Entomological Club, in the vicinity of St. Louis, Missouri.

By Henry McElhose and Hermann Schwarz.

Danais plexippus, Linn. Abundant.
Agraulis vanillae, Linn. Rare.
Euptoieta claudia, Cram. Common Sept. and Oct.
Argynnis diana, Cram. 1 male at Pevely, 27 miles south of St. Louis.
" *idalia*, Dru. Rare.
" *cybele*, Fabr. Common.
Phyciodes nycteis, Db.-Hew. Common.
" *ismeria*, Db.-Lec. Rare.
" *tharos*, Dru. Common.
" " var. *morpheus* Edw. Common.
" " var. *packardii* Scud. Rare.
" " var. *marcia* Edw. Rare.
Melitaea phaeton. Rare.
Grapta interrogationis Fabr. Common.
" " var. *fabricii* Edw. Scarce.
" " var. *umbrosa* Lint, Common.
" *comma* Harris. Common.
" " var. *harrisii* Edw. Common.
" " var. *dryas* Edw. Scarce.
" *progne* Cram. Scarce.
" *j-album* Bd.-Lec. Very rare.
Vanessa antiopa Linn. Common.
" *milberti* Godt. Very rare.
Pyrameis atalanta Linn. Common.
" *huntera* Fabr. Common.
" *cardui* Linn. Common.
Junonia coenia Hub. Common.
Limenitis ursula Fabr. Common.
" *archippus* Cram. Common.

Apatura celtis Bd.-Lec. Common.
" *clyton* Bd.-Lec. Moderate.
" *flora* Edw. Very rare.
Anaea andria Scud. Common.
Debis portlandia Fabr. Common.
Neonympha eurytris Fabr. Very common.
Satyrus alope Fabr. Very rare.
Libythea bachmani Kirtl. Scarce.
Thecla m-album Bd.-Lec. Scarce.
" *melinus* Hbn. Scarce.
Thecla calanus Hbn. Common.
" " var. *lorata* G. and R. Rare.
" *liparops* Bd.-Lec. Rare.
" *damon* var. *discoidalis* Skinner. (1 specimen Meramec Highlands, April).
" *cecrops* Fabr. Common.
" *irus* Godt. Common.
" *titus* Fabr. Scarce.
Feniseca tarquinius Fabr. Moderate.
Chrysophanus thoe Bdv. Scarce.
" *hypophlaeas* Bdv. Common.
Lycaena pseudargiolus Bd.-Lec. Common.
" " var. *violacea* Edw. Common.
" " var. *marginata* Edw. Scarce.
" *comyntas* Godt. Common.
" *isola* Reak. Scarce.
Pieris protodice Bd.-Lec. Common.
" " var. *vernalis* Edw. Scarce.
" *rapae* Linn. Common.
" " var. *immaculata* Sk. Scarce.
" " var. *novangliae* Scud. Scarce.
Nathalis iole Bdv. Common.
Anthocharis olympia var. *rosa* Edw. Scarce.
" *genutia*, Fabr. Common in spring.
Catopsilia eubule Linn. Common.
Colias caesonia Stoll. Common.
" " var. *rosa* McNeil. Moderate.
" *eurytheme* Bd.-Lec. Moderate.
" " var. *ariadne* Edw. Common.
" " var. *keewadin* Edw. Common.
" " var. *eriphyle*. Rare.
" " var. *albino*.
" *philodice* Godt. Common.
" " var. *albino*.
Terias mexicana Bdv. Moderate.
" *nicippe* Cram. Common.

Terias lisa. Common.
Papilio ajax var. *walshii* Edw. Moderate.
" " var. *telamonides* Feld. Scarce.
" " var. *marcellus* Edw. Moderate.
" *philenor* Linn. Common.
" *polyxenes* Fabr. Common.
" *troilus* Linn. Common.
" *turnus* var. *glaucus* Linn. Scarce.
" *cresphontes* Cram. Moderate.
Ancyloxypha numitor Fabr. Common.
Pamphila zabulon, Bd.-Lec. Common.
" *hobomok* Harris. Common.
" " var. *pocahontas* Scud. Common.
" *campestris* var. *huron.*
" *phylaeus* Dru. Scarce.
" *otho* S. and A. Scarce.
" *peckius* Kirby. Common.
" *manataaqua* Scud. Rare.
" *cernes* Bd.-Lec. Common.
" *verna* Edw. Common.
" *metacomet.* Moderate.
" *fusca* G. and R. Scarce.
" *ocola* Edw. Rare.
Amblyscirtes vialis Edw. Common.
" *samoset* Scud. Scarce.
Pyrgus tessellata Scud. Very common.
Nisoniades brizo Bd.-Lec. Common.
" *martialis* Scud. Common.
" *juvenalis* Fabr. Common.
Pholisora catullus Fabr. Common.
" *hayhurstii* Edw. Moderate.
Eudamus pylades Scud. Common.
" *bathyllus* S. and A. Common.
" *lycidas* S. and A. Common.
" *tityrus* Fabr. Common.

The results of a breeding of Apantesis figurata Drury.

By MAX ROTHKE, Scranton, Pa.

On May 30, of the past year, I captured in the Spring Brook Valley near Scranton, Pa., under unusual circumstances, that is, in the noon hour, a ♀ of *Apantesis figurata* Drury. From the somewhat abundant eggs, I obtained, through care-

ful breeding, 60 specimens, which, as to markings and coloring of the hind wing varied considerably from each other.

The hind wings of the above-mentioned female were black, with a small round red spot slightly above the center toward the costal margin, while just below this towards the outer margin there appeared a larger fork-shaped red spot. The markings on the forewings corresponded on the whole with the cut, as shown in Holland's Moth Book, plate xv, fig. 12, except that the fore cross stripes were faint, and partly not clearly visible, while the markings in the limbal area of the wings near the outer margin, which are totally absent in Holland's figure, were in the shape of an indistinct triangle arising in the center of the rear cross stripes. The forms which resulted were as follows:

(a) Hind wings red, with a black band at the costal and outer margin, similar to Holland's figure 12, besides having an oblong black spot extending inward from the costal marginal band; this spot, as well as the stripes, in all cases were larger than given in that figure: 1 ♂ and 2 ♀.

(b) The same form, but the ground color of the hind wings yellow instead of red: 4 ♂ and 3 ♀ ; in two ♀ of this form the yellow shaded slightly into the flesh color.

(c) The markings more or less like the mother, except that the small round spot in the hind wings was plainly marked in a few, some having only a very small dot, while in most cases it was missing altogether. The largest number had the large forked spot very prominent and resembling that of the mother specimen, appearing stronger in some and weaker to the invisible in others; in one example the hind wings being entirely black. The females were more numerous in this case than the males; there being fifteen of the former and twelve of the latter.

(d) The same form, but with yellow instead of red spots: 8 ♂ and 9♀ ; several of this lot also showed the yellow shading into the flesh color and may be taken as middle forms between the red and yellow specimens. I consider the example with the entirely black hind wings as belonging to the yellow form, for the reason that in this, as in all those with

the yellow markings, the bands on the forewings are somewhat lighter in color than in the red ones.

Among the total lot of sixty specimens three have either the fore or hind wings shading into the gray, some showing a tendency to albinism, two with the hind wings red and one with yellow.

The larvæ were fed with lettuce from the earliest stage, later I fed most of them with dandelion, a few were fed with lettuce until transformation; both lots, however, resulted in yellow as well as red forms.

The breeding was carried on indoors in a temperature of the ordinary living room and in almost total darkness; no experiment with the chrysalids was attempted. The imagos emerged in the latter part of July and the early part of August. An attempt at further propagation was not successful, the same being the case in 1905, when I sacrificed several specimens for same purpose.

OVIPOSITION OF CHRYSOPA SPECIES.—On August 8, 1903, at Cumberland, Md., a female *Chrysopa* was observed to alight on a grass stem in a large meadow, and after a few minutes fly from there to a clover leaf. From its peculiar actions, oviposition was suspected; the insect was careful in choosing a position, and the tip of the abdomen was moved up and down. After tentative examination of the under surface of the leaf with jaws and tip of abdomen, it came to the upper surface and finally took position on the discal portion of the leaf near the midrib; the body was in its normal position. The abdomen then began to move up and down, and the penultimate segments became swollen, giving a knotted appearance to the whole. After a few seconds, the tip of the abdomen was placed flat against the leaf and this was daubed several times with a viscous secretion forming a mat, the base and support of the egg-petiole. Resting on this mat of secreted matter, the tip of the abdomen was then slowly raised, while at the same time the secretion continued and quickly hardened on exposure to the air, becoming visible to the eye. In this way the petiole was formed. Continuing the slow, regular, upward movement of the abdomen, there suddenly came into view a large whitish object, which proved to be the egg. After this was out of the insect, the upward movement of the abdomen stopped, and the egg was held in position until the secretion had hardened. The egg was deposited after the stem or petiole had reached a height of a quarter of an inch.—A. A. GIRAULT.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JULY, 1907.

The Seventh International Zoological Congress will be held in Boston, Mass., from August 19th to 23rd, and will be an event of very considerable moment to those interested in the subject. There will be an Entomological Section and in addition the Entomological Society of America will meet, and the program will be an attractive one. The new entomological society has done wonderful things during its short life, and the membership is large and growing.

The Entomological Club of the American Association for the Advancement of Science was a very weak affair and lacked continuity. The ephemeral character of the offices and officers made it impossible to maintain any proper records. The new society will add strength to the American Association and also bind together the entomologists of America. A great work can be done by the Entomological Society of America if it will encourage and try to build up new entomological societies in the south and west, They in their turn can offer inducements to people to join and take an interest in entomology.

We predict a long life and a most useful career for the new society. The time is not far distant when it will be considered an honor to be a member, and it will be a laudable ambition for entomologists to try and become worthy of fellowships.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE NEWS will not be published for August or September. The next number will appear October 1st (No. 8).

While collecting in Sapello Canyon, New Mexico, some years ago, I made a few notes on the early stages of *Argynnis nitocris nigrocaerulea* Ckll., which may be of some interest until someone works out the complete life history. Eggs were laid August 24th, and were examined September 4th. Probably yellow when laid, pinkish in color, conoidal, flattened at the base and run to a blunt point at the micropyle; well-marked longitudinal ribs, with many transverse ridges between; each ridge is joined at the apex with its fellow. There is a small central opening or depression at the apex. Eggs hatched September 7th. First stage of larva—Head black; body very pale greenish-yellow; eleven rows of green warts, lateral ones bear long setæ. Second stage—Appearance totally changed; numerous black, shining spines, tipped with coarse black hairs; body yellowish-brown, with numerous single hairs or setæ. The larvæ probably died as the rough notes end here. They were not intended for publication when written.—HENRY SKINNER.

PHENGODES Illiger.— A note on luminous females and larvæ.—For a number of years I have taken, in numbers fairly common at electric lights, during June and July, in McPherson, Kansas, males of *Phengodes*, which prove to be *Phengodes fusciceps* Lec.

The summer of 1905, I heard of two specimens of "glow worms," but failed to secure them. In May and June, 1906, I was so fortunate as to secure two specimens of these "glow worms," and the last of July, a third specimen, and heard of as many more during these months. They were found on the lawns of residences on warm evenings. The first two specimens were of a cream color and opalescent in certain lights. The July specimen (which was probably a larva, and not an adult female) was cream colored on ventral surface and sides, but the dorsal part of each segment was dark brown, shading to black. Of the June specimens, one was larger than the other, the larger being about twenty-eight millimeters when extended and moving, and the smaller about twenty-three millimeters in length. The last of July specimen was of the same length as the smaller one of the June specimens, but was more slender than either of the others.

They were kept in a tin box with a glass cover. When taken out doors the latter part of June and the first half of July in the twilight of warm evenings the males of *Phengodes fusciceps* would appear in numbers. One was observed beating against the wire screen of a door endeavoring to enter the room where the "glow worms" were kept.

On opening the screen, it flew in, entered the open box and at once copulated with the larger female. It was confined with the females, but only survived two days. Unfortunately, I was not acquainted with the food of the larviform females, so that during the entire life in confinement, some seven or eight weeks, no eggs were obtained. Of the two females, one was kept from May 20th to July 15th, and the other (to which the male came) from June 1st to July 28th. Had I provided their proper food—myriapods—I believe eggs and larvæ would have been secured.

During the day they remained coiled and inactive; became active at night, and intensely luminous; every segment, spiracle and line, apparently, showing a bead of greenish-yellow phosphorescent light. This luminosity was present in the three specimens in the same degree, but the larger specimen, for a period of five nights, showed not a ray of light. At the end of this period, it again became luminous. This would indicate that the insects controlled the luminosity.

The three specimens are now in the hands of Mr. Herbert S. Barber, of the Smithsonian Institution, who, with Mr. E. A. Schwarz, of the same institution, is engaged in the preparation of a revision of the Phengodinæ.—W. KNAUS, McPherson, Kansas.

Doings of Societies.

At the meeting of the Feldman Collecting Social held on April 14th, 1907, at the residence of H. W. Wenzel, 1523 So. Thirteenth Street, Philadelphia, there were ten members present, President Daecke in the chair. The following gentlemen were elected to membership: H. A. Wenzel, H. A. Kaeber, George M. Green and H. L. Viereck, all of the city of Philadelphia.

Professor Smith said he had received from Mr. F. Weigand, of Philadelphia, an inflated larva and three imagos (two male and one female) of a *Cucullia* new to science, bred by Mr. Weigand. These moths emerged in spring, which is unusual in this genus, the habit of the other species being to emerge in fall.

Mr. Laurent gave a brief account of his trip to Southern Central Florida from January 12th to March 30th, of the present year. He said that no Lepidoptera appeared until March 1st; in all about 400 specimens were collected. Coleoptera were very scarce, and Mr. Laurent suggested that the scarcity of insects was due to the dry season.

Mr. H. W. Wenzel made some remarks on the collection of his son and Dr. Castle, made at Tybee Island, and showed a number of new and interesting species.

Mr. Harbeck reported the capture of *Leptogaster virgatus* Coq. at Trenton, N. J., on July 7th, as new to the New Jersey list.

Mr. Wenzel showed specimens of *Pityophagus cephalotes* Lec. taken at Iona, N. J. April 30th. This species was described from a unique specimen from Pennsylvania, and is not represented in the collection at Washington, nor in the Horn collection. Mr. Wenzel also exhibited some small tubes open at both ends, and charged in the centre with cyanide of potassium, for collecting minute insects.

FRANK HAIMBACH, *Secretary.*

H. D. MERRICK.

It was with great sorrow and regret that we learned of the death of Mr. Merrick. He had been a student of the Lepidoptera for a number of years, and he and his father, Mr. F. A. Merrick, have a host of friends and correspondents who will greatly feel his loss.

Harry Duncan Merrick, only son of Mr. and Mrs. Frank A. Merrick, of New Brighton, Pa., died June 5th, at 4 o'clock, at his home in Cleveland, O., of acute pneumonia, after but a few days' illness. The news of his death came as a great shock to his many friends in New Brighton and the Beaver Valley. Mr. Merrick had not been in good health for several years but had been able to attend to his business interests. He contracted pneumonia, but was not thought to be in a serious condition. His parents received a message that he was critically ill. They at once went to Cleveland and were with him when the end came.

Harry was born and raised in New Brighton and had many friends throughout the Beaver Valley who will mourn his death. He had been engaged in business in Cleveland for the past few years. He was 38 years of age and is survived by his wife, his parents, and one sister, Mrs. F. H. Darragh.